

Strategies for Optimising Domestic Solid Waste  
Management Systems in Urban Areas of Australia and  
South Korea

by  
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## **CERTIFICATE OF AUTHORSHIP/ORIGINALITY**

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I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Signature of Candidate

## Abstract

In today's world, with rapidly developing technologies and booming population, solid waste management has become a major concern. In general, awareness of this problem could lead to the development of improved pollution control technologies and rigorous policies for solid waste handling systems and disposal, in order to minimise the environmental impacts of this waste. In addition, policy-makers need to develop and implement effective municipal solid waste management strategies, taking into account all economic, technical, and environmental objectives and factors.

As the population continues to increase in both Australia and South Korea, the need for strategies to optimise municipal solid waste systems and manage waste is becoming more urgent. It is important to understand that solid waste management is a complex task, which depends as much upon organisation and cooperation between households, communities, private enterprises and government at all levels as it does upon recycling and disposal systems. A conventional view is that either private or public management is more efficient for managing municipal solid waste systems, irrespective of the nature of the resource, or the socio-economic situation of the people. However, because many local governments lack the appropriate financial, technical and human resources, they are neither able nor willing to manage these systems.

Industrialised countries such as Australia and South Korea produce millions of tonnes of municipal solid waste every year, which deplete the world's natural resources and have negative consequences for the environment. In recognition of this problematic global trend, the question of environmental protection for the world's sustainable development through solid waste management systems has been given special attention by many countries, including Australia and South Korea. This study has sought to provide the cities of Sydney and Seoul with tools that will enable them to evaluate the environmental and economic performance of the various elements of their existing or proposed waste management systems. The tools are based on the best information publicly available at the present time, with a commitment to revise this information periodically to ensure that it is up-to-date. The tools are intended as guides only; they do not prescribe the best system for each city. The determination of the best system for a community must take into account several factors, including social and political considerations.

A survey was designed and conducted with the purpose of collecting information on the attitudes of the residents of Sydney and Seoul about municipal solid waste management, how they perceive the current programs of their respective cities in terms of collection, processing and disposal, and how they believe the waste management programs of their cities could be improved in terms of decreasing the amounts of waste generated and effectively managing the collected wastes.

The researcher applied the second version of the White model, the Integrated Municipal Waste (IMW-2) model. The application of the MSW analysis to the two different cities provided an interesting comparison of economic cost, environmental cost and disposal cost. For example, the cost of disposal is quite similar between the two cities. The result does not clearly confirm the environmental superiority of the incineration over the landfill. However, if an incineration facility is introduced in Sydney, an increase of the economic cost of the system will occur. Even though these comparisons are not 100% rigorous, this analysis is still useful for giving some estimation of future MSW management strategies.

The study has used a structured focused comparison to investigate the prevailing waste management programs of Sydney and Seoul and determine the strengths, weaknesses, opportunities and threats in each, in order to develop a waste management model that can be utilised in each city. To achieve optimal results, solid waste management programs must be based on the life-cycle philosophy, filling in the gaps to assess the economic affordability of waste systems, to evaluate the environmental effects involving a product or process, to implement ways to improve or lessen these impacts, and to call for greater public participation in the solid waste management program.

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# Table of Contents

|  |               |
|--|---------------|
| <b>CHAPTER 1 INTRODUCTION .....</b>                            | <b>1</b>      |
| 1-1 Background .....   | 1             |
| 1-2 Objectives of the Study .....                              | 3             |
| 1-3 Background of the Two Cities .....                         | 4             |
| 1-3-1 Sydney .....   | 5             |
| 1-3-2 Seoul .....  | 6             |
| 1-4 Trends toward Municipal Solid Waste (MSW) Management ..... | 7             |
| 1-5 Strategy of Solid Waste Management .....                   | 10            |
| 1-6 Research Outline .....                                     | 13            |
| <br><b>CHAPTER 2 LITERATURE REVIEW .....</b>                   | <br><b>15</b> |
| 2-1 Functional Elements of an MSW Management System .....      | 15            |
| 2-1-1 Generation .....   | 15            |
| 2-1-2 Collection .....   | 16            |
| 2-1-3 Processing .....   | 17            |
| 2-1-4 Disposal .....   | 21            |
| 2-2 Solid Waste Management Practices .....                     | 22            |
| 2-2-1 Waste Management Hierarchy .....                         | 22            |
| 2-2-2 Market Development Options .....                         | 24            |
| 2-3 Technological Options .....                                | 25            |
| 2-3-1 Mechanical Separation Technologies .....                 | 25            |
| 2-3-2 Biological Treatment Technologies .....                  | 26            |
| 2-3-3 Thermal Waste .....                                      | 29            |
| 2-3-4 Landfill Technologies .....                              | 31            |
| 2-4 Waste Management Models .....                              | 35            |
| 2-4-1 Economic Instruments .....                               | 36            |
| 2-4-2 Life-Cycle Assessment (LCA) .....                        | 39            |
| 2-4-3 Other Evaluating Tools .....                             | 42            |
| 2-5 Conclusion .....   | 43            |
| <br><b>CHAPTER 3 METHODOLOGY .....</b>                         | <br><b>45</b> |
| 3-1 Structure of the Methodology Section .....                 | 45            |
| 3-1-1 Research Questions .....                                 | 45            |
| 3-1-2 Data Collection and Research Design .....                | 46            |

|  |    |
|--|----|
| 3-2 Descriptive Method.....                  | 47 |
| 3-2-1 Research Process .....                 | 48 |
| 3-2-2 Data-Gathering Tools.....              | 50 |
| 3-3 Case Study .....                         | 50 |
| 3-3-1 Survey .....                           | 50 |
| 3-3-2 Sampling Design .....                  | 52 |
| 3-3-3 Respondents to the Study.....          | 52 |
| 3-4 Statistical Treatment .....              | 53 |
| 3-5 Analysis of Documents.....               | 54 |
| 3-6 Analysis of the Literature.....          | 54 |
| 3-7 Data-Processing.....                     | 54 |
| 3-8 Structured Focused Comparison.....       | 55 |
| 3-9 Ethical Consideration for the Study..... | 56 |
| 3-10 Data Analysis.....                      | 56 |

## **CHAPTER 4 CASE STUDY: SYDNEY MSW MANAGEMENT**

|   |    |
|---|----|
| 4-1 Introduction.....                               | 57 |
| 4-1-1 Socio-Demographic Profile .....               | 58 |
| 4-1-2 General View of the Environment .....         | 61 |
| 4-1-3 Knowledge of Household Waste Management ..... | 63 |
| 4-1-4 Recycling Collection and Composting.....      | 69 |
| 4-1-5 Views on New Ideas .....                      | 78 |
| 4-2 Analysis.....                                   | 81 |
| 4-3 Statistical Analysis .....                      | 85 |
| 4-3-1 Normality.....                                | 85 |
| 4-3-2 Reliability Analysis.....                     | 89 |
| 4-3-3 Multiple Regressions .....                    | 91 |
| 4-3-4 ANOVA Analysis .....                          | 93 |

## **CHAPTER 5 CASE STUDY: SEOUL MSW MANAGEMENT**

|   |     |
|---|-----|
| 5-1 Introduction.....                               | 95  |
| 5-1-1 Socio-Demographic Profile .....               | 95  |
| 5-1-2 General View of the Environment .....         | 99  |
| 5-1-3 Knowledge of Household Waste Management ..... | 102 |
| 5-1-4 Recycling Collection .....                    | 110 |
| 5-1-5 Views about Other Systems .....               | 118 |

|                                  |     |
|----------------------------------|-----|
| 5-1-6 Food Waste .....           | 122 |
| 5-2 Analysis .....               | 125 |
| 5-3 Statistical Analysis .....   | 125 |
| 5-3-1 Normality .....            | 126 |
| 5-3-2 Reliability Analysis ..... | 129 |
| 5-3-3 Multiple Regressions ..... | 131 |
| 5-3-4 ANOVA Analysis .....       | 133 |

## **CHAPTER 6 STRUCTURED FOCUS COMPARISON OF THE CASE STUDIES IN SYDNEY AND SEOUL ..... 135**

|   |     |
|---|-----|
| 6-1 Sydney .....                                    | 135 |
| 6-2 Seoul .....                                     | 140 |
| 6-3 Sydney and Seoul .....                          | 147 |
| 6-3-1 General View of the Environment .....         | 147 |
| 6-3-2 Knowledge of Household Waste Management ..... | 147 |
| 6-3-3 Household waste management .....              | 148 |
| 6-3-4 Recycling Collection .....                    | 150 |
| 6-3-5 Views on Other Systems .....                  | 150 |
| 6-4 Conclusions .....                               | 151 |

## **CHAPTER 7 SOLID WASTE MANAGEMENT MODEL ..... 154**

|   |     |
|---|-----|
| 7-1 Introduction .....  | 154 |
| 7-2 Waste Management Systems .....  | 155 |
| 7-3 Description of the Solid Waste Management Systems in Sydney and Seoul ..... | 156 |
| 7-4 System Boundaries .....   | 161 |
| 7-4-1 Recycling .....   | 161 |
| 7-4-2 Composting .....  | 162 |
| 7-4-3 Energy Recovery .....   | 163 |
| 7-4-4 Landfilling .....   | 164 |
| 7-5 Life Cycle Assessment .....   | 165 |
| 7-6 The Integrated Municipal Waste (IMW-2) Model .....                          | 166 |
| 7-7 Application of Integrated Municipal Waste model .....                       | 169 |
| 7-8 Results .....   | 170 |
| 7-9 Conclusions .....   | 177 |



## **CHAPTER 8 CONCLUSION AND RECOMMENDATIONS. 179**

**8-1 Survey Results ..... 179**

**8-2 Application of IMW-2 Model on Sydney and Seoul ..... 181**

**8-3 Recommendations ..... 182**

**REFERENCES ..... 184**

## **APPENDIX**

**Appendix 1**

**Appendix 2**

**Appendix 3**

## List of Figures

|  |     |
|--|-----|
| Figure 1-1 The UR-3R Process .....   | 11  |
| Figure 3-1 Conceptual research approach .....                                  | 49  |
| Figure 4-1 Respondents According to Gender .....                               | 58  |
| Figure 4-2 Employment Status .....   | 60  |
| Figure 4-2 Educational Attainment .....  | 61  |
| Figure 4-4 Important Issues .....  | 63  |
| Figure 4-5 Source of Information .....   | 65  |
| Figure 4-6 Destination of Non-recyclable Waste .....                           | 65  |
| Figure 4-7 Most Important Household Waste Management Practice .....            | 66  |
| Figure 4-8 Cost of Collecting and Disposing of Household Waste .....           | 67  |
| Figure 4-9 Willingness to Recycle .....  | 72  |
| Figure 4-10 Satisfaction with Kerbside Recycling .....                         | 72  |
| Figure 4-11 Household Responsibility .....                                     | 74  |
| Figure 4-12 Recyclable Items Discarded As Waste .....                          | 75  |
| Figure 4-13 Feelings about Recycled Products .....                             | 76  |
| Figure 4-14 Composting .....   | 76  |
| Figure 4-15 Advantages/disadvantages .....                                     | 77  |
| Figure 4-16 Benefits of Composting .....                                       | 78  |
| Figure 4-17 Disadvantages of Composting .....                                  | 78  |
| Figure 4-18 Plastic Bags Ban .....   | 80  |
| Figure 4-19 Public Response to Monetary Reward .....                           | 80  |
| Figure 4-20 Household Payment for Waste Collection Services .....              | 81  |
| Figure 4-21 Multicollinearity and Singularity .....                            | 87  |
| Figure 5-1 Respondents According to Gender .....                               | 96  |
| Figure 5-2 Type of Property .....  | 96  |
| Figure 5-3 Respondents According to the Number of Households Members .....     | 97  |
| Figure 5-4 Proportion of Respondents According to Living Arrangement .....     | 97  |
| Figure 5-5 Proportion of Respondents According to Employment Status .....      | 98  |
| Figure 5-6 Proportion of Respondents According to Educational Attainment ..... | 98  |
| Figure 5-7 Sources of Information .....  | 105 |
| Figure 5-8 Importance of Household Waste at Home .....                         | 105 |

|  |     |
|--|-----|
| Figure 5-9 Performance in Separating Household Waste .....                             | 106 |
| Figure 5-10 Respondents' Perceived Cost of Waste Council Services .....                | 106 |
| Figure 5-11 Level of Satisfaction with the Council's Waste Services .....              | 107 |
| Figure 5-12 Respondents' Satisfaction with the Volume-Based Waste Charge System .....  | 119 |
| Figure 5-13 Discontinuation of free plastic bag use in shops .....                     | 121 |
| Figure 5-14 Monetary reward for returning aluminium cans/containers/milk/juice cartons | 121 |
| Figure 5-15 Multicollinearity and Singularity .....                                    | 128 |
| Figure 6-1 Waste Management Facilities in Sydney .....                                 | 136 |
| Figure 7-1 Trends of Sydney Municipal Waste per person per year (Kg) .....             | 161 |
| Figure 7-2 System Boundary for Recycling .....   | 162 |
| Figure 7-3 System Boundary for Composting .....  | 163 |
| Figure 7-4 System Boundary for the Production of Energy from Waste .....               | 164 |
| Figure 7-5 Waste Management Systems(Landfill) .....                                    | 166 |
| Figure 7-6 Components of Integrated Waste Management System .....                      | 168 |
| Figure 7-7 Detailed Structure of Integrated Waste Management System .....              | 168 |
| Figure 7-8 Breakdown of MSW of Seoul .....   | 170 |
| Figure 7-9 Breakdown of MSW of Sydney .....  | 170 |

## List of Tables

|   |    |
|---|----|
| Table 2-1 Situation of Collection and Recycling of Main Recyclable Materials 2001 ..... | 19 |
| Table 2-2 Input Wastes and Output Products by Waste Technology Type .....               | 34 |
| Table 4-1 Number of People in the Household .....                                       | 59 |
| Table 4-2 Description of Household .....  | 60 |
| Table 4-3 Type of Property .....  | 60 |
| Table 4-4. Environmental Concern .....  | 61 |
| Table 4-5 Helping the Environment .....   | 62 |
| Table 4-6 Environmental Involvement .....   | 62 |
| Table 4-7 Importance of Household Waste Management .....                                | 63 |
| Table 4-8 Reducing Household Waste at Home .....  | 64 |
| Table 4-9 Practices to Reduce Household Waste .....                                     | 64 |
| Table 4-10 Interest in Household Waste Management .....                                 | 65 |
| Table 4-11 Evaluation of Performance .....  | 67 |
| Table 4-12 Satisfaction about Services .....  | 68 |
| Table 4-13 Reluctance to Commit to Waste Management Practices .....                     | 69 |
| Table 4-14 Areas for Improvement .....  | 69 |
| Table 4-15 Items for Kerbside Recycling Collection .....                                | 70 |
| Table 4-16 Frequency of Using Kerbside Recycling Service .....                          | 70 |
| Table 4-17 Feelings about Recycling .....   | 71 |
| Table 4-18 Reluctance to Recycle .....  | 71 |
| Table 4-19 Improving Kerbside Recycling Arrangements .....                              | 73 |
| Table 4-20 Motivations for Recycling .....  | 74 |
| Table 4-21 Reasons for not Composting .....   | 77 |
| Table 4-22 Volume-based Waste Charge System .....                                       | 79 |
| Table 4-23 Household Waste Management Schemes .....                                     | 79 |
| Table 4-24 Descriptive statistics .....   | 85 |
| Table 4-25 Correlations .....   | 89 |
| Table 4-26 Item-Total Statistics .....  | 90 |
| Table 4-27 Reliability Statistics .....   | 91 |
| Table 4-28 Model Summary .....  | 92 |
| Table 4-29 Coefficients .....   | 92 |



|   |     |
|---|-----|
| Table 4-30 ANOVA .....  | 93  |
| Table 5-1 Environmental Concern of the Respondents .....  | 99  |
| Table 5-2 Helping the Environment .....   | 100 |
| Table 5-3 Willingness to Help Protect the Environment .....   | 100 |
| Table 5-4 Issues Considered as Important by Respondents .....   | 101 |
| Table 5-5 Importance of Household Waste Management for the Preservation of the<br>Environment and Natural Resources ..... | 102 |
| Table 5-6 Destination of Non-recyclable Waste .....   | 103 |
| Table 5-7 Most Important Household Waste Management Practice .....  | 103 |
| Table 5-8 Interest in Learning More about Managing Household Waste Management .....                                       | 104 |
| Table 5-9 Current Household Management Practices of the Respondents .....   | 108 |
| Table 5-10 Reluctant to Commit to Household Waste Collection Service .....  | 109 |
| Table 5-11 Suggestions as to How the Household Waste Management could be more<br>effectively improved. ....               | 110 |
| Table 5-12 Items that the Respondents Do Not Separate for Recycling Collection .....                                      | 111 |
| Table 5-13 Frequency of Respondents' Usage of the Recycling Services .....  | 112 |
| Table 5-14 Attitudes Towards Recycling .....  | 112 |
| Table 5-15 Reasons Why Respondents Are Less Committed to Recycling .....  | 113 |
| Table 5-16 Willingness to Increase Recycling Efforts .....  | 114 |
| Table 5-17 Items that respondents think they could have recycled but have thrown away ..                                  | 114 |
| Table 5-18 Respondents' Satisfaction with the Recycling Services .....  | 115 |
| Table 5-19 Improving Recycling Arrangements .....   | 115 |
| Table 5-20 Person in the Household Responsible for Recycling .....  | 116 |
| Table 5-21 Factors that influence the respondents to recycle .....  | 117 |
| Table 5-22 Feelings about recycled as compared to non-recycled products .....   | 118 |
| Table 5-23 Activities that would be prepared in the respondents' area .....   | 119 |
| Table 5-24 Preference for Household Payment for Waste Collection Services .....   | 122 |
| Table 5-25 Managing Food/Organic Waste Generated at Home .....  | 123 |
| Table 5-26 Reasons for Not Separating Food/Organic Waste from Normal Household Waste<br>.....                             | 123 |
| Table 5-27 Advantages of Food Collection .....  | 124 |
| Table 5-28 Disadvantages of Food Collection .....   | 124 |
| Table 5-29 Descriptive Statistics .....   | 126 |
| Table 5-30 Correlations .....   | 129 |

|   |     |
|---|-----|
| Table 5-31 Item—Total Statistics .....  | 130 |
| Table 5-32 Reliability Statistics .....   | 131 |
| Table 5-33 Model Summary .....  | 132 |
| Table 5-34 Coefficients .....   | 133 |
| Table 5-35 ANOVA .....  | 133 |
| Table 7-1 Trends in Seoul's Waste Generation .....  | 158 |
| Table 7-2 Trends in Seoul's Food Waste Generation .....   | 158 |
| Table 7-3 Composition of Solid Waste in Major Municipal Centres .....                             | 160 |
| Table 7-4 Results of Seoul and Sydney MSW Systems Analysis with the Application of<br>IMW-2 ..... | 171 |
| Table 7-5 Cost of Living .....  | 172 |
| Table 7-6 Comparison of Sydney and Seoul MSW disposal system .....                                | 176 |

## List of Pictures

|  |     |
|--|-----|
| Picture 6-1 Waste Collection in Sydney .....               | 139 |
| Picture 6-2 Recycling Materials Guidelines in Sydney ..... | 140 |
| Picture 6-3 Standardised Waste Bags in Seoul .....         | 143 |
| Pictures 6-4 Waste Collection in Seoul .....               | 144 |